

■ *Welcome !!!*

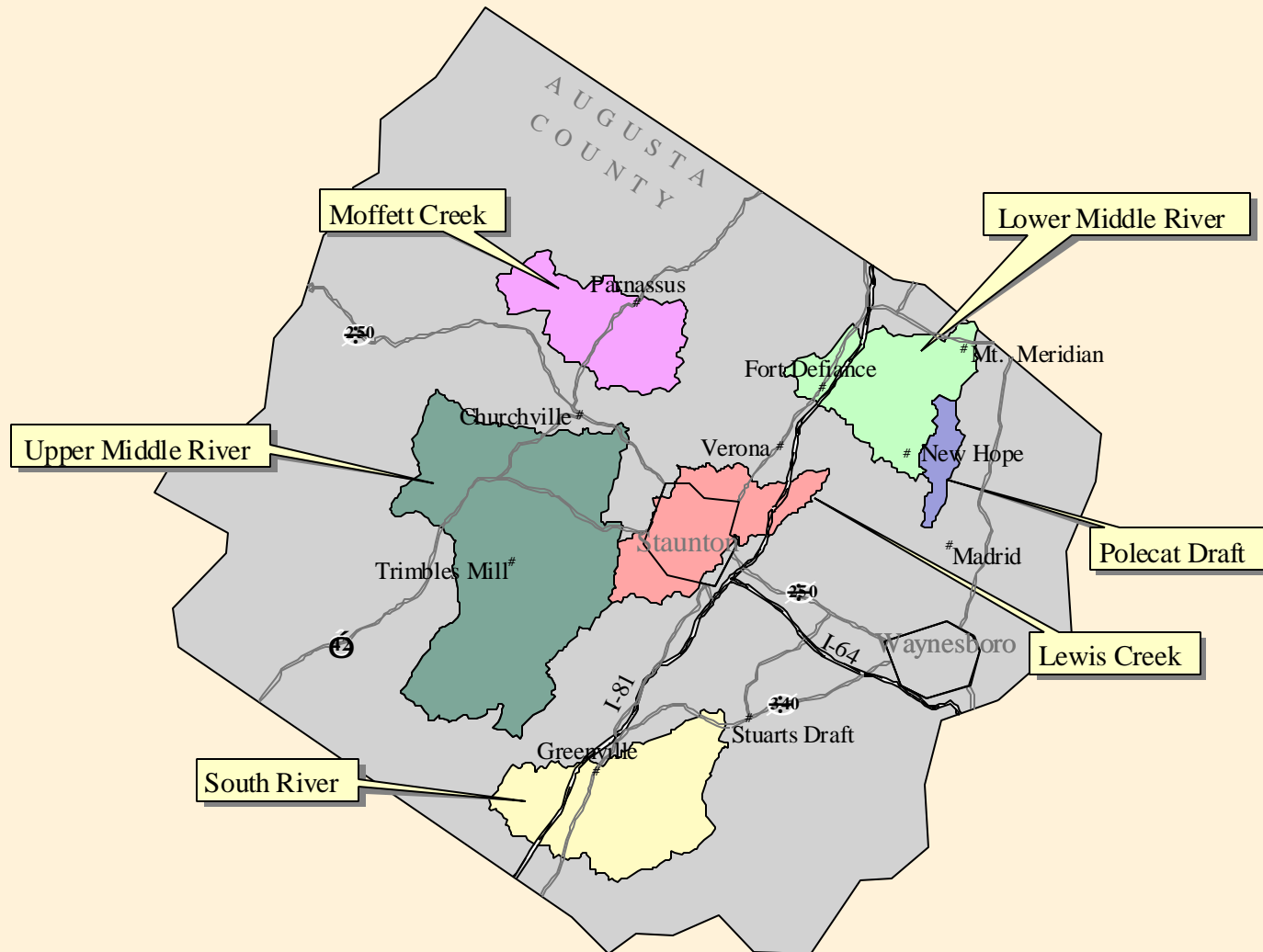


Department of Conservation & Recreation

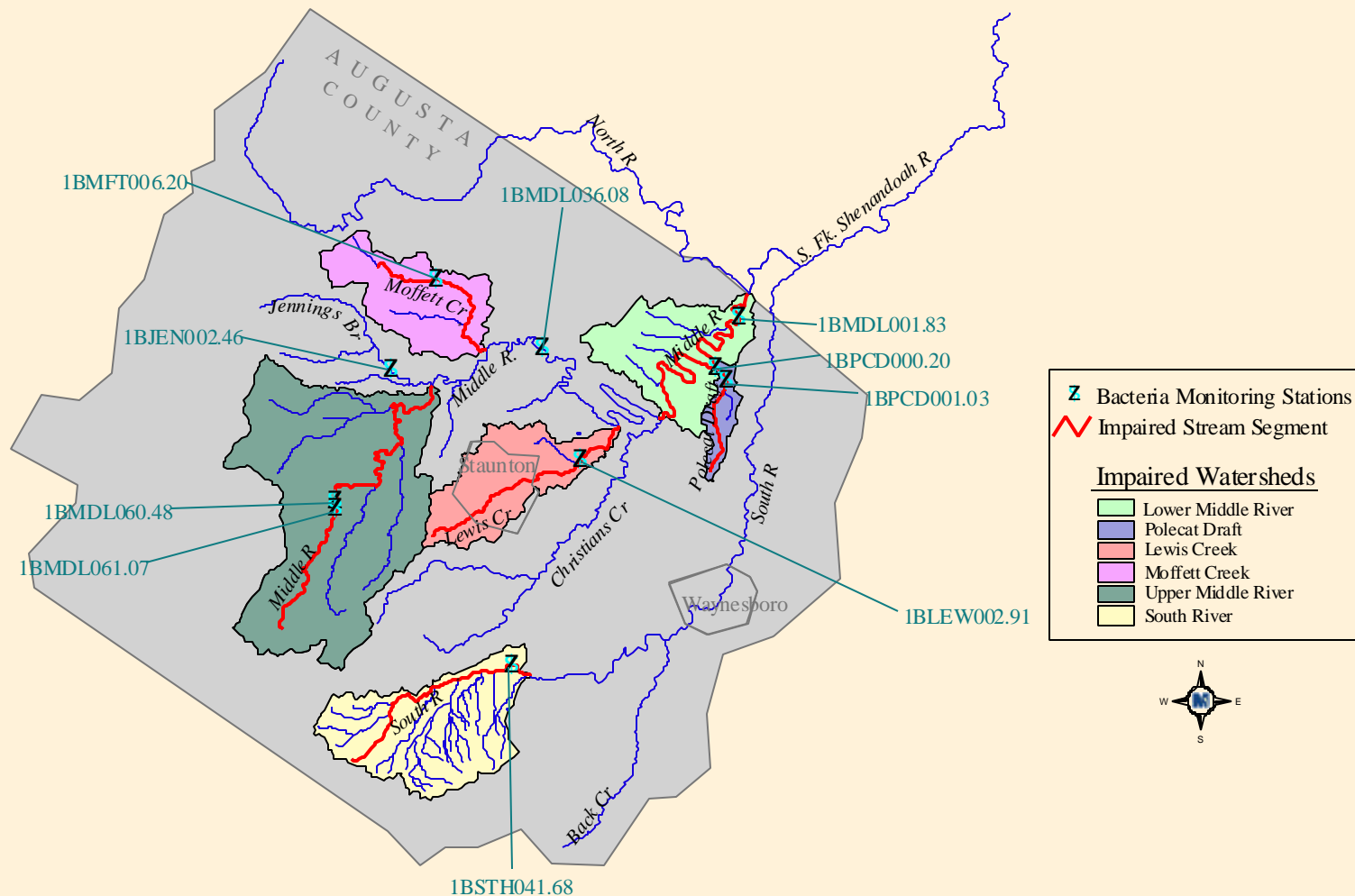
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Middle River TMDL

Augusta County



DEQ Bacteria Monitoring Network



Livestock Data Sources

- **Population**
 - **Virginia Ag. Statistics**
 - **Consultation with
Headwaters SWCD,
Livestock Producers, VADCR,
NRCS, Pilgrim's Pride, VA
Dairyman's Assc. Equine
Vet.**
 - **Watershed visits**

Wildlife Data Sources

- **Population based on data provided by VDGIF Biologists, included:**

Raccoon	Muskrat	Beaver
Deer	Turkey	Other
Ducks	Goose	
- **City of Staunton provided waterfowl numbers for Gypsy Hill Park.**

Human Data Sources

- Population, Housing Units, Septic Systems based on U.S. Census
- City of Staunton and Augusta County - Sanitary Sewer Network
- VDH on estimated failure rates for septic systems
- VDH and DEQ on biosolids application sites and rates.

Daily Fecal Coliform production by Source

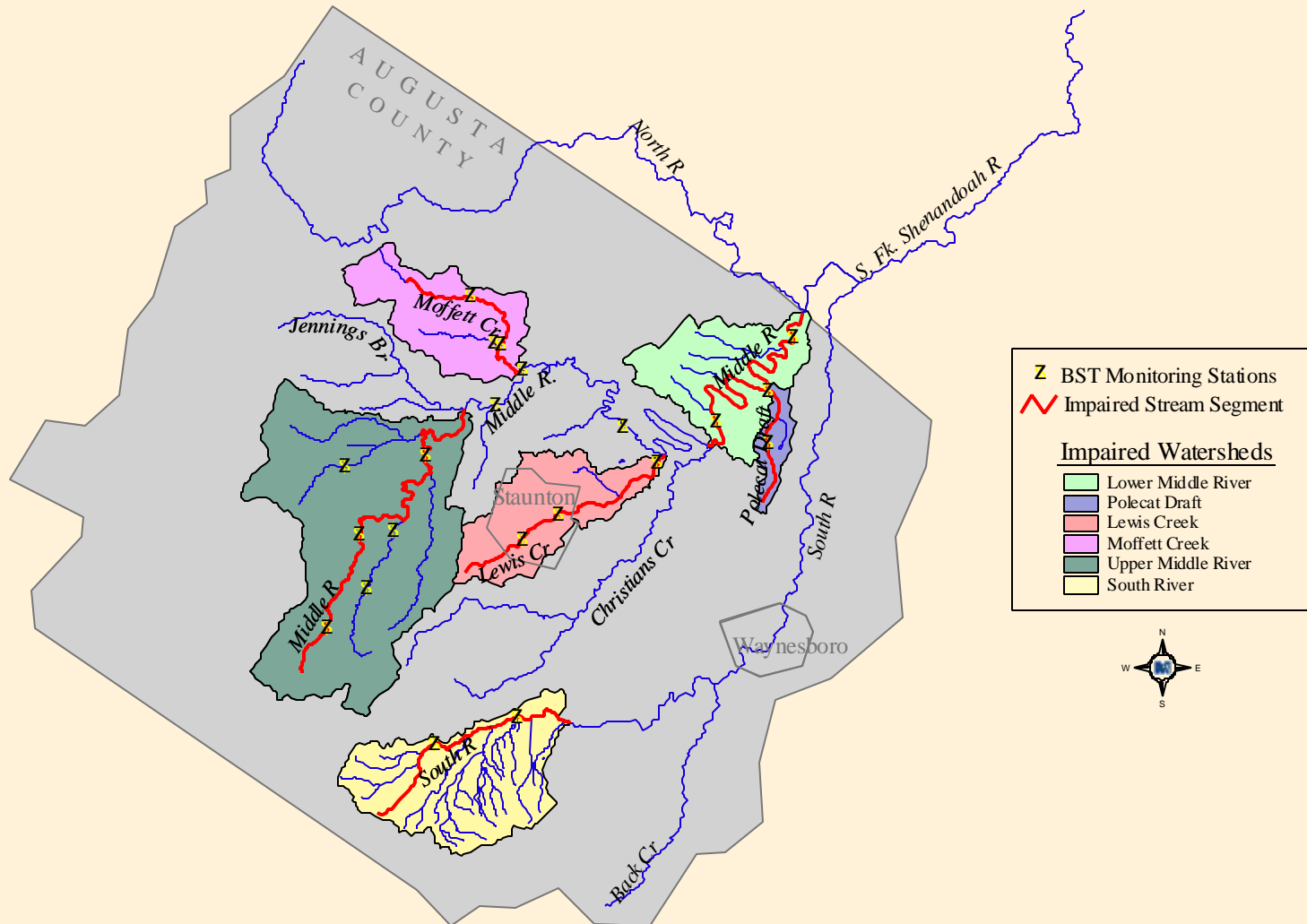
Source	Daily Fecal Production (million) (cfu/day)
Human	1,950
Pet	450
Horse	420
Beef Cattle	33,000
Diary Cattle	
Milked or dry Cow	25,200
Heifer	11,592
Sheep	27,000
Deer	347
Raccoon	113
Muskrat	25
Beaver	0.2
Goose	799
Duck	2,430
Mallard	2,430
Wild Turkey	93

Source	The equivleant number of sources to one beef cow
Human	16.9
Pet	73.3
Horse	78.6
Beef Cattle	1.0
Diary Cattle	
Milked or dry Cow	1.3
Heifer	2.8
Sheep	1.2
Deer	95.1
Raccoon	292.0
Muskrat	1,320.0
Beaver	165,000.0
Goose	41.3
Duck	13.6
Mallard	13.6
Wild Turkey	354.8

Sources: ASAE, Map Tech, Metcalf
& Eddy, Louis Berger Group, Inc.

Middle River

BST Monitoring Network



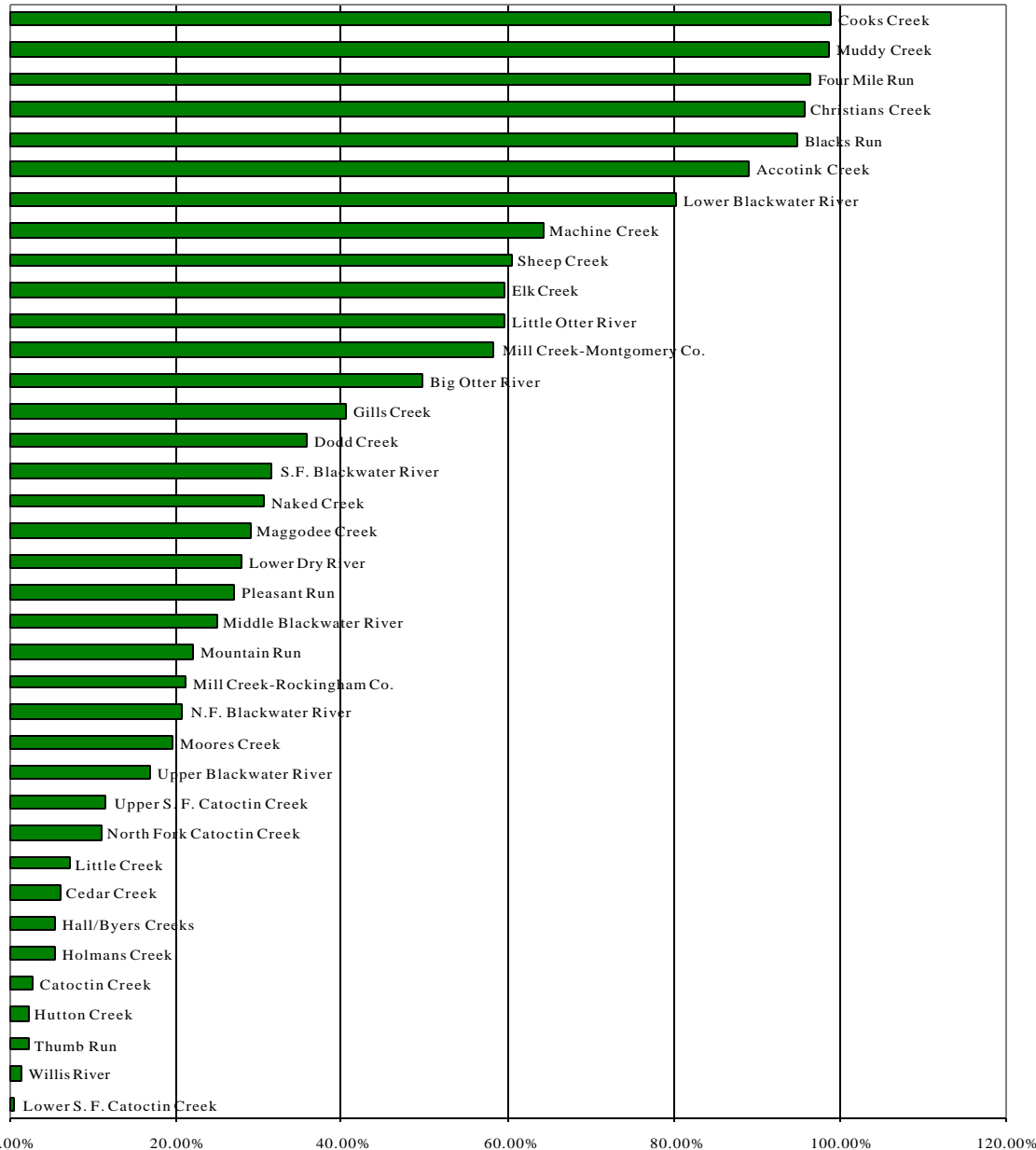
Bacteria Source Tracking Preliminary Results*

- In all 20 sites livestock appears to be the most prominent source identified.
- At 7 of these sites wildlife appears to be a significant contributor.
- In 2 sites human sources appear to to be a significant contributor.

***These results are undergoing further evaluation and are subject to change.**

Virginia's Fecal Bacteria TMDLs - 2002

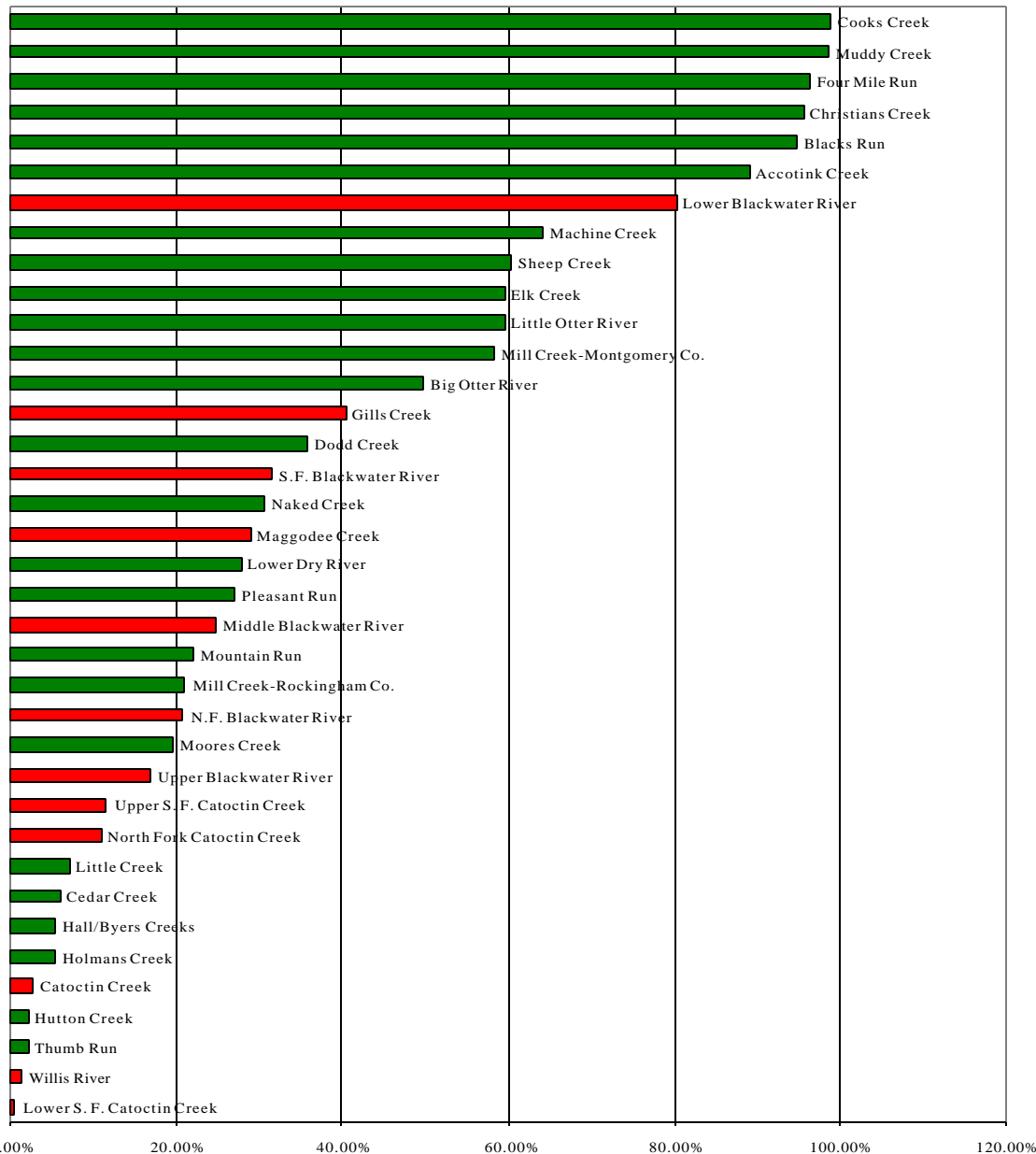
(Required Reductions - Percentage of Existing Annual Loading)



**All contractors
overall average
reduction=38.1%**

Virginia's Fecal Bacteria TMDLs - 2002

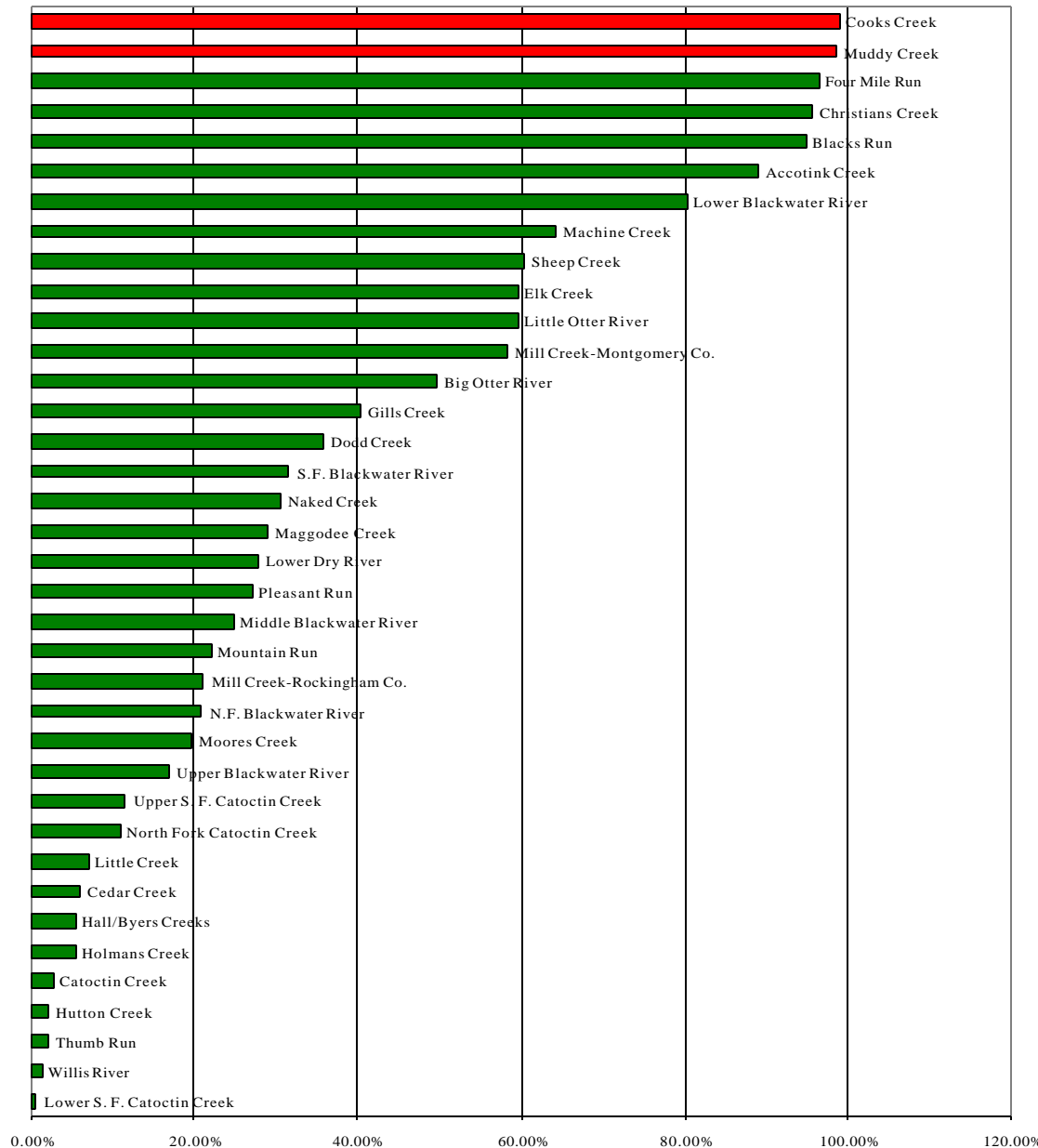
(Required Reductions - Percentage of Existing Annual Loading)



MapTech, Inc.
overall average
reductions = 22.6%

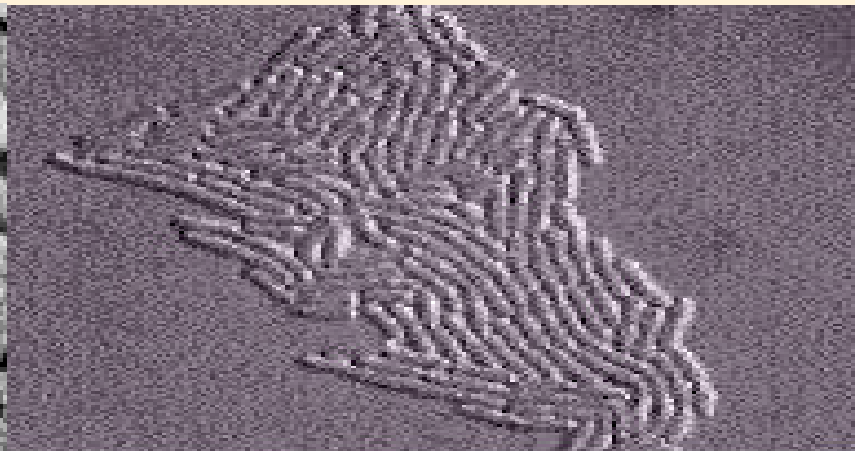
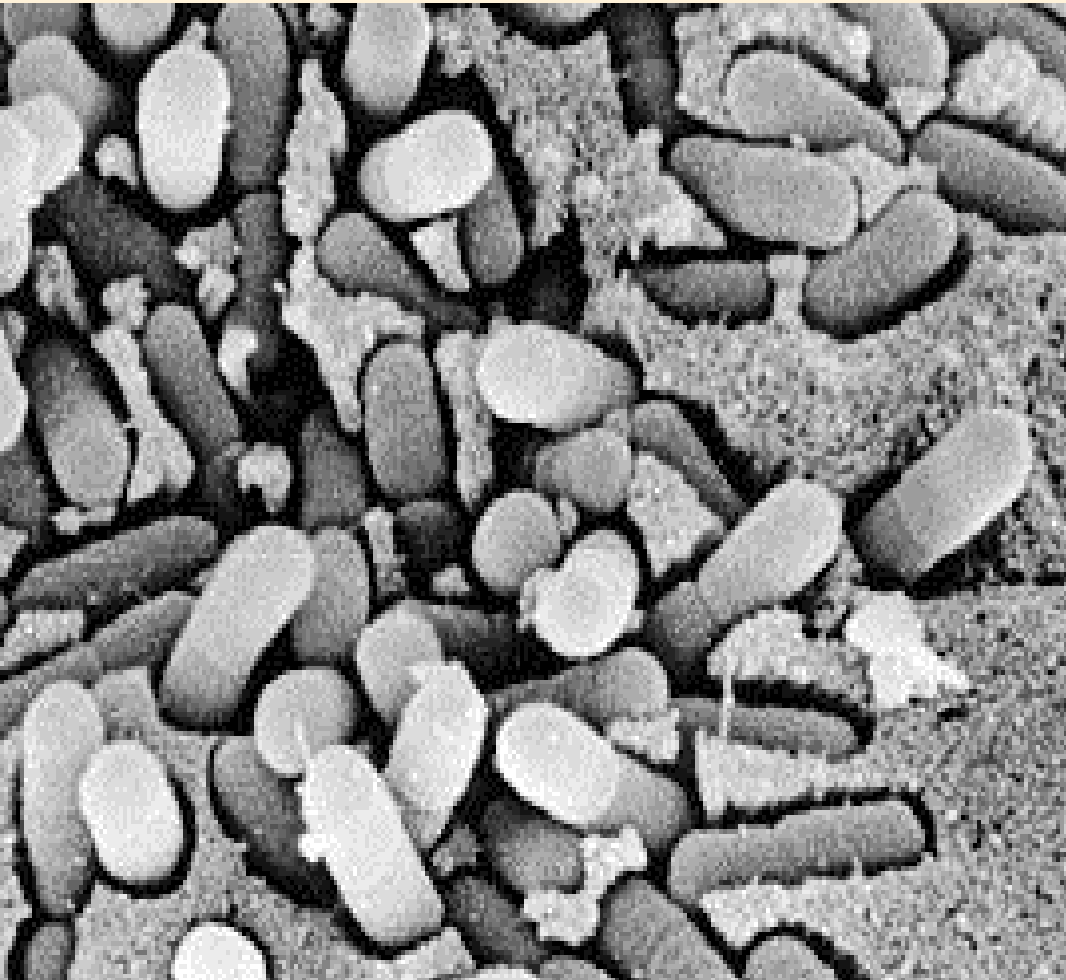
Virginia's Fecal Bacteria TMDLs - 2002

(Required Reductions - Percentage of Existing Annual Loading)



**EPA's contractor
overall average
reduction = 98.84%**

Escherichia coli – *E. coli*



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